AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) [[An]] A method for embedding additional information ~~embedding method for embedding additional information~~ into an input audio signal and outputting an output audio signal having the embedded additional information, the method comprising:

an orthogonal transform step of orthogonally transforming [[an]] the input audio signal ~~and thus calculating an~~ to generate a plurality of orthogonal transform ~~coefficient~~ coefficients; ~~and~~

a shift and addition step of damping and shifting [[the]] a predetermined number of orthogonal transform ~~coefficient~~ coefficients selected from the plurality of orthogonal transform coefficients in the direction of the frequency axis and adding ~~additional information~~ the damped and shifted orthogonal transform coefficients to the original orthogonal transform ~~coefficient~~ coefficients to form an output audio signal, the added damped and shifted orthogonal coefficients comprising the embedded additional information; and

outputting the output audio signal having the embedded additional information~~,~~

~~wherein the shift step and addition step generates the additional information by performing inverse orthogonal transform to a predetermined number of orthogonal transform coefficient~~.

2. (Currently Amended) The ~~additional information embedding~~ method as claimed in claim 1, wherein the orthogonal transform step includes carrying out a modified discrete cosine transform (MDCT) ~~MDCT~~ of the audio signal ~~so as~~ to calculate [[an]] MDCT coefficients ~~coefficient~~, and wherein the shift and addition step includes damping and shifting the calculated MDCT ~~coefficient~~ coefficients in the direction of the frequency axis and adding the damped and shifted MDCT coefficients to the original MDCT coefficients, the added damped and shifted MDCT coefficients comprising the embedded additional information ~~additional information to the original MDCT coefficient so as to embed the additional information~~.

3. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 1, wherein the shift and addition step includes adding the orthogonal transform ~~coefficient~~ coefficients shifted on the frequency axis to the original orthogonal transform ~~coefficient~~ coefficients so that a frequency masking condition and a temporal masking condition are met.

4. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 1, wherein the shift and addition step includes carrying out the addition when the value obtained by adding the shifted orthogonal transform ~~coefficient~~ coefficients to the value of the original orthogonal transform ~~coefficient~~ coefficients is not higher than a predetermined value.

5. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 1, wherein the shift and addition step includes prohibiting the shift and addition in accordance with the polarity of the value obtained by adding the shifted orthogonal transform ~~coefficient~~ coefficients to the value of the original orthogonal transform ~~coefficient~~ coefficients.

6. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 1, wherein the shift and addition step includes carrying out the shift and addition when the input audio signal falls within a range from an upper limit value to a lower limit value.

7. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 6, wherein the shift and addition step includes carrying out the shift and addition when the input audio signal falls within a range from an upper limit value to a lower limit value set on the basis of the human auditory characteristics.

8. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 1, wherein the shift and addition step includes carrying out the shift and addition of the orthogonal transform ~~coefficient~~ coefficients within a predetermined frequency band.

9. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 2, wherein the shift and addition step includes carrying out the shift and addition of the MDCT ~~coefficient~~ coefficients within a predetermined frequency band.

10. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 1, wherein the shift and addition step includes dividing the frequency band of the input audio signal and carrying out shift and addition for each of the divided frequency bands.

11. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 10, wherein the shift and addition step includes reversing the shifting direction of the divided adjacent frequency bands.

12. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 1, further comprising a step of scrambling the output audio signal ~~calculated by the shift and addition step,~~ using a pseudo-random signal.

13. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 2, wherein the shift and addition step includes shifting the MDCT ~~coefficient~~ coefficients toward the frequency-increasing side and adding the shifted MDCT ~~coefficient~~ coefficients to the original MDCT ~~coefficient~~ coefficients.

14. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 13, wherein at the shift and addition step, the frequency of the MDCT ~~coefficient~~ coefficients is increased by ((sampling frequency/number of samples of MDCT coefficient) x 2N) Hz, as the MDCT ~~coefficient~~ coefficients [[is]] are shifted by 2N units (where N is a natural number).

15. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 14, wherein at the shift and addition step, the amplitude of the MDCT coefficients is substantially equal to the amplitude of the input audio signal.

16. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 2, wherein the shift and addition step includes shifting the MDCT ~~coefficient~~ coefficients toward the frequency-decreasing side and adding the shifted MDCT ~~coefficient~~ coefficients to the original MDCT ~~coefficient~~ coefficients.

17. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 16, wherein at the shift and addition step, the frequency of the MDCT ~~coefficient~~ coefficients is decreased by ((sampling frequency/number of samples of MDCT coefficient) x 2N) Hz, as the MDCT ~~coefficient~~ coefficients is shifted by 2N units (where N is a natural number).

18. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 17, wherein at the shift and addition step, the amplitude of the MDCT coefficients is substantially equal to the amplitude of the input audio signal.

19. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 2, wherein the shift and addition step includes shifting the MDCT ~~coefficient~~ coefficients by 2N units (where N is a natural number).

20. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 2, wherein the shift and addition step includes shifting the MDCT coefficient by 2N-1 units (where N is a natural number).

21. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 2, wherein the shift and addition step includes adding the shifted MDCT ~~coefficient~~ coefficients within a critical band of a frequency masking area of the MDCT ~~coefficient~~ coefficients of the original input audio signal.

22. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 1, wherein the embedded additional information [[is]] comprises limitation information for prohibiting the transfer of the input audio signal.

23. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 1, wherein the embedded additional information [[is]] comprises

limitation information for prohibiting recording of the input audio signal to a recording medium.

24. (Currently amended) The ~~additional information embedding~~ method as claimed in claim 1, wherein the embedded additional information [[is]] comprises work data corresponding to the input audio signal.

25. (Currently amended) ~~An additional information embedding~~ A device for embedding additional information into an input audio signal and outputting an output audio signal having the embedded additional information, the device comprising:

orthogonal transform means for orthogonally transforming [[an]] the input audio signal ~~and thus calculating an~~ to generate a plurality of orthogonal transform ~~coefficient~~ coefficients; ~~and~~

shift and addition means for damping and shifting [[the]] a predetermined number of orthogonal transform ~~coefficient~~ coefficients selected from said plurality of orthogonal transform coefficients in the direction of the frequency axis and adding the ~~additional information~~ damped and shifted orthogonal transform coefficients to the original orthogonal transform ~~coefficient~~ coefficients to form the output audio signal, the added damped and shifted orthogonal coefficients comprising the embedded additional information; and

output means for outputting the output audio signal having embedded additional information;

~~wherein the shift and addition step generates the additional information by carrying out inverse orthogonal transform to a predetermined number of the orthogonal transform coefficient~~.

26. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the orthogonal transform means carries out a modified discrete cosine transform (MDCT) ~~MDCT~~ of the audio signal ~~so as~~ to calculate [[an]] MDCT ~~coefficient~~ coefficients, and wherein the shift and addition means damps and shifts the calculated MDCT ~~coefficient~~ coefficients in the direction of the frequency axis and adds the damped and shifted MDCT coefficients to the original MDCT coefficients, the added damped and shifted MDCT coefficients comprising the embedded additional information ~~additional information to the original MDCT coefficient so as to embed the additional information~~.

27. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the shift and addition means adds the orthogonal transform ~~coefficient~~ coefficients shifted on the frequency axis to the original orthogonal transform ~~coefficient~~ coefficients so that a frequency masking condition and a temporal masking condition are met.

28. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the shift and addition means carries out the addition when the value obtained by adding the shifted orthogonal transform ~~coefficient~~ coefficients to the value of the original orthogonal transform ~~coefficient~~ coefficients is not higher than a predetermined value.

29. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the shift and addition means prohibits the shift and addition in accordance with the polarity of the value obtained by adding the shifted orthogonal transform ~~coefficient~~ coefficients to the value of the original orthogonal transform ~~coefficient~~ coefficients.

30. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the shift and addition means carries out the shift and addition when the input audio signal falls within a range from an upper limit value to a lower limit value.

31. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 30, wherein the shift and addition means carries out the shift and addition when the input audio signal falls within a range from an upper limit value to a lower limit value set on the basis of the human auditory characteristics.

32. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the shift and addition means carries out the shift and addition of the orthogonal transform ~~coefficient~~ coefficients within a predetermined frequency band.

33. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 26, wherein the shift and addition means carries out the shift and addition of the MDCT ~~coefficient~~ coefficients within a predetermined frequency band.

34. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the shift and addition means divides the frequency band of the input audio signal and carries out shift and addition for each of the divided frequency bands.

35. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 34, wherein the shift and addition means reverses the shifting direction of the divided adjacent frequency bands.

36. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, further comprising means for scrambling the output audio signal ~~calculated by the shift and addition means,~~ using a pseudo-random signal.

37. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 26, wherein the shift and addition means shifts the MDCT ~~coefficient~~ coefficients toward the frequency-increasing side and adds the shifted MDCT ~~coefficient~~ coefficients to the original MDCT ~~coefficient~~ coefficients.

38. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 37, wherein at the shift and addition means, the frequency of the MDCT ~~coefficient~~ coefficients is increased by ((sampling frequency/number of samples of MDCT coefficient) x 2N) Hz, as the MDCT ~~coefficient~~ coefficients [[is]] are shifted by 2N units (where N is a natural number).

39. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 38, wherein at the shift and addition means, the amplitude of the MDCT coefficients is substantially equal to the amplitude of the input audio signal.

40. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 26, wherein the shift and addition means shifts the MDCT ~~coefficient~~ coefficients toward the frequency-decreasing side and adds the shifted MDCT ~~coefficient~~ coefficients to the original MDCT ~~coefficient~~ coefficients.

41. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 40, wherein at the shift and addition means, the frequency of the MDCT ~~coefficient~~ coefficients is decreased by ((sampling frequency/number of samples

of MDCT coefficient) x 2N) Hz, as the MDCT ~~coefficient~~ coefficients is shifted by 2N units (where N is a natural number).

42. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 41, wherein at the shift and addition means, the amplitude of the MDCT coefficients is substantially equal to the amplitude of the input audio signal.

43. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 26, wherein the shift and addition means shifts the MDCT ~~coefficient~~ coefficients by 2N units (where N is a natural number).

44. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 26, wherein the shift and addition means shifts the MDCT ~~coefficient~~ coefficients by 2N-1 units (where N is a natural number).

45. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 26, wherein the shift and addition means adds the shifted MDCT ~~coefficient~~ coefficients within a critical band of a frequency masking area of the MDCT ~~coefficient~~ coefficients of the original input audio signal.

46. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the orthogonal transform means and the shift and addition means are integrally ~~constituted~~ formed in a single circuit.

47. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the embedded additional information [[is]] comprises limitation information for prohibiting transfer of the input audio signal.

48. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the embedded additional information is limitation information for prohibiting recording of the input audio signal to a recording medium.

49. (Currently amended) The ~~additional information embedding~~ device as claimed in claim 25, wherein the embedded additional information is work data corresponding to the input audio signal.

50. (Currently amended) A ~~demodulation~~ method for ~~receiving~~ demodulating [[an]] embedded additional information in a received audio signal, ~~in which~~ the embedded additional information generated by ~~carrying out~~ performing an inverse orthogonal transform [[to]] on a predetermined number of [[an]] a plurality of orthogonal transform ~~coefficient~~ coefficients generated by orthogonally transforming the audio signal ~~is embedded and demodulating the additional information~~, the method comprising:

a receiving step of receiving [[an]] the audio signal having embedded additional information, ~~in which~~ the additional information [[is]] embedded by damping and shifting a predetermined number of orthogonal transform coefficients selected from the plurality

of orthogonal transform coefficients in the direction of the frequency axis and adding the damped and shifted orthogonal transform coefficients to the audio signal on the original frequency axis; ~~and~~

a demodulation step of demodulating the embedded additional information on the basis of the polarity of the received audio signal at ~~each~~ predetermined ~~interval~~ intervals on the frequency axis; and~~, of the received signal~~

an outputting step of outputting the demodulated embedded additional information.

51. (Canceled)

52. (Currently amended) The ~~demodulation~~ method as claimed in claim [[51]] 50, wherein the receiving step includes receiving the audio signal having embedded additional information, ~~in which~~ the additional information [[is]] embedded by damping and shifting in the direction of the frequency axis [[an]] modified discrete cosine transform (MDCT) ~~MDCT~~ coefficient calculated by performing an MDCT [[of]] on the audio signal and adding the ~~resultant~~ damped and shifted MDCT coefficient to the original MDCT coefficient.

53. (Currently amended) The ~~demodulation~~ method as claimed in claim 50, wherein the receiving step includes receiving the audio signal having embedded additional information, ~~in which~~ the additional information [[is]] embedded by AM modulation, and wherein the demodulation step includes demodulating the embedded

additional information on the basis of the polarity of the received audio signal at ~~each~~ predetermined ~~interval~~ intervals on the frequency axis~~, of the received signal~~.

54. (Currently amended) The ~~demodulation~~ method as claimed in claim 50, wherein the receiving step includes receiving the audio signal having embedded ~~in which the~~ additional information ~~is embedded~~ by FM modulation, and wherein the demodulation step includes demodulating the embedded additional information on the basis of the polarity of the received audio signal at ~~each~~ predetermined ~~interval~~ intervals on the frequency axis~~, of the received signal~~.

55. (Currently amended) The ~~demodulation~~ method as claimed in claim 50, wherein the receiving step includes receiving the audio signal having embedded ~~in which the~~ additional information ~~is embedded~~ by Hilbert conversion, and wherein the demodulation step includes demodulating the embedded additional information on the basis of the polarity of the received audio signal at ~~each~~ predetermined ~~interval~~ intervals on the frequency axis~~, of the received signal~~.

56. (Currently amended) The ~~demodulation~~ method as claimed in claim 50, wherein the demodulation step includes demodulating the embedded additional information on the basis of the polarity of the received audio signal at ~~each~~ predetermined ~~interval~~ intervals on the frequency axis within a predetermined frequency band ~~of the received signal~~.

57. (Currently amended) The ~~demodulation~~ method as claimed in claim 50, wherein the embedded additional information [[is]] comprises control information for prohibiting transfer of the received audio signal.

58. (Currently amended) The ~~demodulation~~ method as claimed in claim 50, wherein the embedded additional information [[is]] comprises control information for prohibiting recording of the received audio signal to a recording medium.

59. (Currently amended) The ~~demodulation~~ method as claimed in claim 50, wherein the embedded additional information [[is]] comprises work data corresponding to the received audio signal.

60. (Currently amended) A ~~demodulation~~ device for ~~receiving~~ demodulating [[an]] embedded additional information in a received audio signal ~~in which~~ the embedded additional information generated by ~~carrying out~~ performing an inverse orthogonal transform [[to]] on a predetermined number of [[an]] orthogonal transform ~~coefficient~~ coefficients generated by orthogonally transforming the audio signal ~~is embedded and demodulating the additional information,~~ the device comprising:

receiving means for receiving [[an]] the audio signal having embedded additional information, ~~in which~~ the additional information [[is]] embedded by damping and shifting a predetermined number of orthogonal transform coefficients selected from the plurality of orthogonal transform coefficients in the direction of the frequency axis and adding the

damped and shifted orthogonal transform coefficients to the audio signal on the original frequency axis; ~~and~~

demodulation means for demodulating the embedded additional information on the basis of the polarity of the received audio signal at ~~each~~ predetermined ~~interval~~ intervals on the frequency axis; and~~, of the received signal~~

an outputting means for outputting the demodulated embedded additional information.

61. (Canceled)

62. (Currently amended) The ~~demodulation~~ device as claimed in claim [[61]] 60, wherein the receiving means receives the audio signal having embedded additional information, ~~in which~~ the embedded additional information [[is]] embedded by damping and shifting in the direction of the frequency axis [[an]] a modified discrete cosine transform (MDCT) ~~MDCT~~ coefficient calculated by performing an MDCT [[of]] on the audio signal and adding the ~~resultant~~ damped and shifted MDCT coefficient to the original MDCT coefficient.

63. (Currently amended) The ~~demodulation~~ device as claimed in claim 60, wherein the receiving means receives receiving the audio signal having embedded information, ~~in which~~ the additional information [[is]] embedded by AM modulation, and wherein the demodulation means demodulates the embedded additional information on

the basis of the polarity of the received audio signal at ~~each~~ predetermined ~~interval~~ intervals on the frequency axis~~, of the received signal~~.

64. (Currently amended) The ~~demodulation~~ device as claimed in claim 60, wherein the receiving means receives the audio signal having embedded ~~in which the~~ additional information [[is]] embedded by FM modulation, and wherein the demodulation means demodulates the embedded additional information on the basis of the polarity of the received audio signal at ~~each~~ predetermined ~~interval~~ intervals on the frequency axis~~, of the received signal~~.

65. (Currently amended) The ~~demodulation~~ device as claimed in claim 60, wherein the receiving means receives the audio signal having embedded ~~in which the~~ additional information [[is]] embedded by Hilbert conversion, and wherein the demodulation means demodulates the embedded additional information the basis of the polarity of the received audio signal at ~~each~~ predetermined ~~interval~~ intervals on the frequency axis~~, of the received signal~~.

66. (Currently amended) The ~~demodulation~~ device as claimed in claim 60, wherein the demodulation means demodulates the embedded additional information on the basis of the polarity of the received audio signal at ~~each~~ predetermined ~~interval~~ intervals on the frequency axis within a predetermined frequency band of the received audio signal.

67. (Currently amended) The ~~demodulation~~ device as claimed in claim 60, wherein the embedded additional information [[is]] comprises control information for prohibiting transfer of the received audio signal.

68. (Currently amended) The ~~demodulation~~ method as claimed in claim 60, wherein the embedded additional information [[is]] comprises control information for prohibiting recording of the received audio signal to a recording medium.

69. (Currently amended) The ~~demodulation~~ method as claimed in claim 60, wherein the embedded additional information [[is]] comprises work data corresponding to the received audio signal.